

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

What is claimed is:

- 1 1. A method of implementing real-time video-
- 2 audio interaction by data synchronization in an
- 3 Internet game, comprising the steps of:
- 4 establishing an Internet transmission channel
- 5 between a first internet game client and a
- 6 second internet game client, wherein the
- 7 Internet transmission channel is not
- 8 connected to an Internet game server;
- 9 executing an internet game in the first Internet
- 10 game client and the second internet game
- 11 client and connecting the first and second
- 12 Internet game clients to the internet game
- 13 server;
- 14 retrieving first real-time video data and first
- 15 real-time audio data in the first internet
- 16 game client in the Internet game;
- 17 compressing/encoding the first real-time video
- 18 data into a plurality of first video data
- 19 frames, and compressing/encoding the first
- 20 real-time audio data into a plurality of
- 21 first audio data packets in the first
- 22 Internet game client;
- 23 packaging the first video data frames and the
- 24 first audio data packets into a transmission
- 25 package in the first Internet game client
- 26 and attaching a time stamp to transmission
- 27 package, wherein the time stamp expresses

Client's ref. : 92022
File : 0660-9881-US/Final/Teresa/Steve

28 the synchronous relationship between the
29 first real-time video and audio data;
30 transmitting the transmission package to the
31 second Internet game client through the
32 Internet transmission channel;
33 decoding the transmission package into second
34 real-time video data and second real-time
35 audio data in the second Internet game
36 client; and
37 synchronizing the second real-time video and
38 audio data according to the time stamp, and
39 outputting the second real-time audio and
40 video data in the second Internet game
41 client in the Internet game.

1 2. The method as claimed in claim 1, wherein
2 the establishment of the Internet transmission channel
3 further comprises the steps of:

4 designating an Internet address of the second
5 Internet game client directly or according
6 to a directory by the first Internet game
7 client, wherein the directory includes the
8 Internet address of the second Internet game
9 client;
10 transmitting a connection request from the first
11 Internet game client to the second Internet
12 game client; and
13 establishing the Internet transmission channel by
14 the second Internet game client in response
15 to the connection request.

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

1 3. The method as claimed in claim 1, wherein if
2 the bandwidth of the Internet transmission channel
3 cannot transmit the first real-time audio data and the
4 first real-time video data simultaneously, the first
5 real-time audio data takes priority over first real-
6 time video data.

1 4. The method as claimed in claim 1, wherein
2 the time stamp provides is time information required
3 to produce the first real-time video data and the
4 first real-time audio data.

1 5. The method as claimed in claim 1, wherein
2 the synchronization is achieved by adding the system
3 time of the second internet game client to the time
4 stamp to generate the display time of the second real-
5 time video and audio data.

1 6. The method as claimed in claim 1, wherein
2 synchronization is achieved by comparing the time
3 stamp the amount of the frames dropped by the second
4 real-time video data.

1 7. The method as claimed in claim 1, wherein
2 playback of the second real-time video data is
3 accomplished by integrating the second real-time video
4 data into the game environments of the Internet game
5 as texture mapping.

1 8. A system of implementing real-time video-
2 audio interaction by data synchronization in an
3 Internet game, comprising:

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

4 an Internet game server, executing an Internet
5 game; and
6 a plurality of Internet game clients, comprising
7 a first Internet game client, a second
8 Internet game client, and an Internet
9 transmission channel, the first and the
10 second Internet game clients connecting to
11 the Internet game server, the Internet
12 transmission channel coupled to the first
13 Internet game client and the second Internet
14 game client

1 9. The system as claimed in claim 8, wherein
2 the first internet game client further comprises:
3 a real-time data retriever, retrieving first
4 real-time video data and first real-time
5 audio data from the first Internet game
6 client;
7 a data encoder, coupled to the real-time data
8 retriever, compressing/encoding the first
9 real-time video data into a plurality of
10 first video data frames, and compressing
11 /encoding the first audio data into a
12 plurality of first audio data packets;
13 a transmission packager, coupled to the data
14 encoder, packaging the first video data
15 frames and the first audio data packets into
16 a transmission package and attaching a time
17 stamp into the transmission package, wherein
18 the time stamp expresses the synchronous

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

19 relationship between the first real-time
20 video data and the first real-time audio
21 data; and

22 an Internet sender, coupled to the transmission
23 packager, transmitting the transmission
24 package to the second Internet game client
25 through the Internet transmission channel.

1 10. The system as claimed in claim 9, wherein if
2 the bandwidth of the Internet transmission channel
3 cannot transmit the first real-time audio data and the
4 first real-time video data simultaneously, the first
5 real-time audio data takes priority over first real-
6 time video data.

1 11. The system as claimed in claim 9, wherein
2 the time stamp provides the time information required
3 to produce the first real-time video data and the
4 first real-time audio data.

1 12. The system as claimed in claim 8, wherein
2 the second Internet game client further comprises:

3 a data decoder, coupled to the Internet
4 transmission channel, decoding the
5 transmission package into second video data
6 and second audio data;

7 a video-audio playback system, coupled to the
8 data decoder, synchronizing the second real-
9 time video and the second real-time audio
10 data according to the time stamp and

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

11 outputting the second video data and the
12 second audio data.

1 13. The system as claimed in claim 12, wherein
2 synchronization is achieved by adding the system time
3 of the second internet game client to the time stamp
4 to generate the display time of the second real-time
5 video and audio data.

1 14. The system as claimed in claim 12, wherein
2 synchronization is achieved by comparing the time
3 stamp the amount of the frames dropped by the second
4 real-time video data.

1 15. The system as claimed in claim 12, wherein
2 the video-audio playback system integrates the second
3 real-time video data into the game environments of the
4 Internet game as texture mapping.

1 16. The system as claimed in claim 8, wherein
2 the internet transmission channel is established by
3 assigning an Internet address to the second Internet
4 game client directly or according to a directory by
5 the first Internet game client, transmitting a
6 connecting request from the first Internet game client
7 to the second Internet game client, and the second
8 Internet game client establishing the Internet
9 transmission channel according to the connecting
10 request, wherein the directory includes the Internet
11 address of the second Internet game client.

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

1 17. A method of implementing real-time
2 interaction by video-audio synchronization between
3 Internet game clients, wherein the Internet game
4 client connects to an Internet game server, and
5 executes an Internet game, comprising the steps of:
6 establishing an Internet transmission channel to
7 an external Internet game client, wherein
8 the Internet transmission channel is not
9 connected to the Internet game server;
10 a real-time data retriever retrieving first real-
11 time video data and first real-time audio
12 data;
13 compressing/decoding the first real-time video
14 data and the first real-time audio data into
15 a first transmission package and attaching a
16 time stamp to the transmission package,
17 wherein the time stamp expresses the
18 synchronous relationship between the video
19 and audio data;
20 transmitting the first transmission package
21 through the Internet transmission channel;
22 receiving a second transmission package through
23 the Internet transmission channel;
24 decompressing/decoding the second transmission
25 package into second real-time video data and
26 second real-time audio data; and
27 synchronizing the second real-time video and the
28 second real-time audio data according to the
29 time stamp, and outputting the second real-

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

30 time audio data and video data in the game
31 environment.

1 18. The method as claimed in claim 17, wherein
2 the establishment of the Internet transmission channel
3 further comprises the steps of:

4 designating an Internet address of a third
5 external Internet game client by the
6 Internet game client or the external
7 Internet game client;
8 transmitting a connecting request to the third
9 Internet game client by the Internet game
10 client or the external Internet game client
11 according to the Internet address; and
12 establishing the Internet transmission channel
13 between the Internet game client and the
14 third Internet game client.

1 19. The method as claimed in claim 17, wherein
2 if the bandwidth of the internet transmission channel
3 cannot transmit the first real-time audio data and the
4 first real-time video data simultaneously, the first
5 real-time audio data takes priority over first real-
6 time video data.

1 20. The method as claimed in claim 17, wherein
2 in the establishing step, the Internet transmission
3 channel is established according to a directory,
4 having an Internet address of the third external
5 Internet game client.

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

1 21. The method as claimed in claim 17, wherein
2 synchronization is achieved by adding the system time
3 of the second internet game client to the time stamp
4 to generate the display time of the second real-time
5 video and audio data.

1 22. The method as claimed in claim 17, wherein
2 synchronization is achieved by comparing the time
3 stamp the amount of the frames dropped by the second
4 real-time video data.

1 23. The method as claimed in claim 17, wherein
2 playback of the second video data is accomplished by
3 integrating the second real-time video data into the
4 game environment as texture mapping.

1 24. A storage medium for storing a computer
2 program providing a method of implementing real-time
3 video-audio interaction by data synchronization
4 between Internet game clients, wherein the Internet
5 game client connects to an Internet game server, and
6 executes an Internet game, the computer program
7 comprising using a computer to perform the steps of:
8 establishing an Internet transmission channel to
9 an external Internet game client, wherein
10 the Internet transmission channel is not
11 connected to the Internet game server;
12 a real-time data retriever retrieving first real-
13 time video data and first real-time audio
14 data;

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

15 compressing/decoding the first real-time video
16 data and the first real-time audio data into
17 a first transmission package, and attaching
18 a time stamp into the transmission package,
19 wherein the time stamp expresses the
20 synchronous relationship between the video
21 and audio data;
22 transmitting the first transmission package
23 through the Internet transmission channel;
24 receiving a second transmission package through
25 the Internet transmission channel;
26 decompressing/decoding the second transmission
27 package into second real-time video data and
28 second real-time audio data; and
29 synchronizing the second real-time video and the
30 second real-time audio data according to the
31 time stamp, and outputting the second real-
32 time audio data and video data in the game
33 environment.

1 25. The method as claimed in claim 24, wherein
2 the establishment of the Internet transmission channel
3 further comprises the steps of:

4 designating an Internet address of a third
5 external Internet game client by the
6 Internet game client or the external
7 Internet game client;
8 transmitting a connecting request to the third
9 Internet game client by the Internet game

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

10 client or the external Internet game client
11 according to the Internet address; and
12 establishing the Internet transmission channel
13 between the Internet game client and the
14 third Internet game client.

1 26. The method as claimed in claim 24, wherein
2 if the bandwidth of the internet transmission channel
3 cannot transmit the first real-time audio data and the
4 first real-time video data simultaneously, the first
5 real-time audio data takes priority over first real-
6 time video data.

1 27. The method as claimed in claim 24, wherein
2 in the establishing step, the Internet transmission
3 channel is established according to a directory,
4 having an Internet address of the third external
5 Internet game client.

1 28. The method as claimed in claim 24, wherein
2 synchronization is achieved by adding the system time
3 of the second internet game client to the time stamp
4 to generate the display time of the second real-time
5 video and audio data.

1 29. The method as claimed in claim 24, wherein
2 synchronization is achieved by comparing the time
3 stamp the amount of the frames dropped by the second
4 real-time video data.

1 30. The method as claimed in claim 24, wherein
2 playback of the second video data is accomplished by

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

3 integrating the second real-time video data into the
4 game environment as texture mapping.

1 31. A computer system of an Internet game,
2 executing an Internet game and having a storage medium
3 for storing a computer program, wherein the computer
4 program is applied to a computer system and executes
5 the method of real-time video-audio interaction
6 between Internet game clients, the Internet game
7 client connecting to an Internet game server,
8 executing an Internet game, and outputting a game
9 environment, the method comprising the steps of:

10 establishing an Internet transmission channel to
11 an external Internet game client, wherein
12 the Internet transmission channel is not
13 connected to the Internet game server;

14 a real-time data retriever retrieving first real-
15 time video data and first real-time audio
16 data;

17 compressing/decoding the first real-time video
18 data and the first real-time audio data into
19 a first transmission package, and attaching
20 a time stamp into the transmission package,
21 wherein the time stamp expresses the
22 synchronous relationship between the video
23 and audio data;

24 transmitting the first transmission package
25 through the Internet transmission channel;

26 receiving a second transmission package through
27 the Internet transmission channel;

Client's ref. : 92022
File : 0660-9881-US/Final/Teresa/Steve

28 decompressing/decoding the second transmission
29 package into second real-time video data and
30 second real-time audio data; and
31 synchronizing the second real-time video and the
32 second real-time audio data according to the
33 time stamp, and outputting the second real-
34 time audio data and video data in the game
35 environment.

1 32. The method as claimed in claim 31, wherein
2 the establishment of the Internet transmission channel
3 further comprises the steps of:

4 designating an Internet address of a third
5 external Internet game client by the
6 Internet game client or the external
7 Internet game client;
8 transmitting a connecting request to the third
9 Internet game client by the Internet game
10 client or the external Internet game client
11 according to the Internet address; and
12 establishing the Internet transmission channel
13 between the Internet game client and the
14 third Internet game client.

1 33. The method as claimed in claim 31, wherein
2 if the bandwidth of the internet transmission channel
3 cannot transmit the first real-time audio data and the
4 first real-time video data simultaneously, the first
5 real-time audio data takes priority over first real-
6 time video data.

Client's ref. : 92022
File : 0660-9881-US/Final/Teresa/Steve

1 34. The method as claimed in claim 31, wherein
2 in the establishing step, the Internet transmission
3 channel is established according to a directory,
4 having an Internet address of the third external
5 Internet game client.

1 35. The method as claimed in claim 31, wherein
2 synchronization is achieved by adding the system time
3 of the second internet game client to the time stamp
4 to generate the display time of the second real-time
5 video and audio data.

1 36. The method as claimed in claim 31, wherein
2 synchronization is achieved by comparing the time
3 stamp the amount of the frames dropped by the second
4 real-time video data.

1 37. The method as claimed in claim 31, wherein
2 playback of the second video data is accomplished by
3 integrating the second real-time video data into the
4 game environment as texture mapping.

1 38. A method of implementing real-time video-
2 audio interaction by data synchronization in an
3 internet game for applying in a first Internet game
4 client and a second Internet game client, wherein the
5 first and second Internet game client execute an
6 Internet game and connect to an Internet game server,
7 comprising the steps of:

8 establishing an Internet transmission channel
9 between the first Internet game client and

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

10 the second Internet game client, wherein the
11 Internet transmission channel is not
12 connected to the Internet game server;
13 retrieving first real-time video data and first
14 real-time audio data in the first Internet
15 game client;
16 producing a plurality of first video data frames
17 and a plurality of first audio data packets;
18 packaging the first video data frames and the
19 first audio data packets into a transmission
20 package and attaching a time stamp into the
21 transmission package, wherein the time stamp
22 expresses the synchronous relationship
23 between the first real-time video and audio
24 data;
25 transmitting the transmission package to the
26 second Internet game client;
27 decoding the transmission package into second
28 real-time video data and second real-time
29 audio data; and
30 synchronizing the second real-time audio and
31 video data according to the time stamp, and
32 outputting the second real-time audio data
33 and video data in the Internet game in the
34 second Internet game client.

1 39. The method as claimed in claim 38, wherein
2 the establishing step further comprises the steps of:
3 designating an Internet address of the second
4 Internet game client directly or according

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

5 to a directory by the first Internet game
6 client, wherein the directory includes the
7 Internet address of the second Internet game
8 client;
9 transmitting a connection request from the first
10 Internet game client to the second Internet
11 game client; and
12 establishing the Internet transmission channel by
13 the second Internet game client in response
14 to the connection request.

1 40. The method as claimed in claim 38, wherein
2 the first real-time audio data is primarily packaged
3 in the first transmission package, and the remaining
4 bandwidth is used for packaging the first real-time
5 video data.

1 41. The method as claimed in claim 38, wherein
2 the first video data frames and the first audio data
3 frames are produced by compressing/encoding.

1 42. The method as claimed in claim 38, wherein
2 the transmission package is transmitted to the second
3 Internet game client through the Internet transmission
4 channel.

1 43. The method as claimed in claim 38, wherein
2 the synchronization is based on system time of the
3 second Internet game client adding the time stamp as
4 display time of the second real-time video and audio
5 data.

Client's ref.: 92022
File: 0660-9881-US/Final/Teresa/Steve

44. The method as claimed in claim 38, wherein synchronization is achieved by comparing the time stamp the amount of the frames dropped by the second real-time video data.

5 45. A system of implementing real-time video-audio interaction by data synchronization in an Internet game for application to a first Internet game client, a second Internet game client, and an internet game server, wherein the Internet game server executes
10 an Internet game, the system comprising:

15 an Internet transmission channel, the first Internet game client and the second Internet game client connecting to the Internet game server to execute the Internet game, the Internet transmission channel coupled to the first and second Internet game clients to execute real-time video-audio interaction.